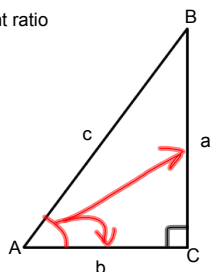


7-4 Trigonometry

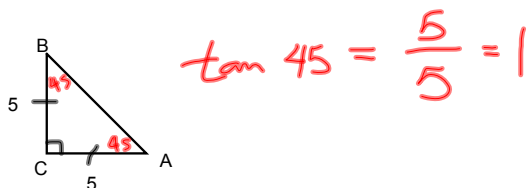
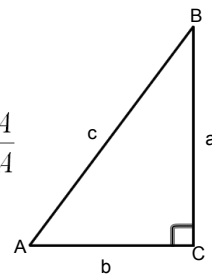
The tangent ratio

Side adjacent to $\angle A$ b Side opposite of $\angle A$ a

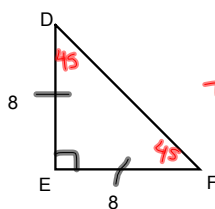
The tangent ratio

$$\tan A = \frac{\text{side opposite } \angle A}{\text{side adjacent } \angle A}$$

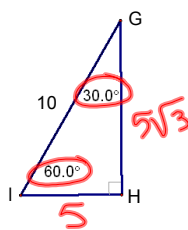
$$\tan = \frac{\text{opp}}{\text{adj}}$$



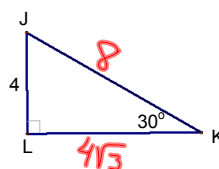
$$\tan 45 = \frac{5}{5} = 1$$



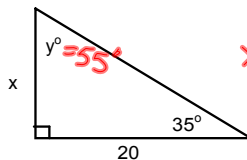
$$\tan 45 = \frac{8}{8} = 1$$



$$\tan 60 = \frac{5\sqrt{3}}{5}$$



Every ^{acute} angle has a specific tangent value



$$\tan 55 = \frac{20}{x}$$

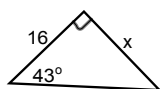
$$x \cdot \tan 55 = 20$$

$$x = \frac{20}{\tan 55}$$

$$\left(\tan 35 = \frac{x}{20} \right) 20$$

$$20 \cdot \tan 35 = x$$

$$14.0 \approx x$$



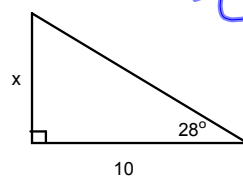
$$\tan 43 = \frac{x}{16}$$

$$16 \cdot \tan 43 = x$$

$$14.9 \approx x$$

Do:

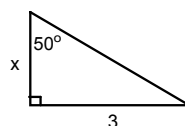
1.



$$\tan 28 = \frac{x}{10}$$

$$x \approx 5.3$$

2.



$$\tan 50 = \frac{3}{x}$$

$$x \approx 2.9$$

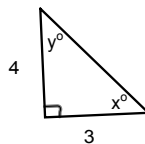
You can also find the angle if you have the legs.



$$\tan x = \frac{2}{2}$$

$$\tan^{-1}\left(\frac{2}{2}\right) = x$$

$$45^\circ = x$$

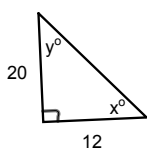


$$\tan x = \frac{4}{3}$$

$$\tan^{-1}\left(\frac{4}{3}\right) = x$$

$$53.1^\circ \approx x$$

$$\left. \begin{array}{l} \tan x = \frac{4}{3} \\ \tan^{-1}\left(\frac{4}{3}\right) = x \\ 53.1^\circ \approx x \end{array} \right\} \begin{array}{l} \tan y = \frac{3}{4} \\ \tan^{-1}\left(\frac{3}{4}\right) = y \\ 36.9^\circ \approx y \end{array}$$



$$\tan x = \frac{20}{12}$$

$$\tan^{-1}\left(\frac{20}{12}\right) = x$$

$$59.0^\circ \approx x$$

